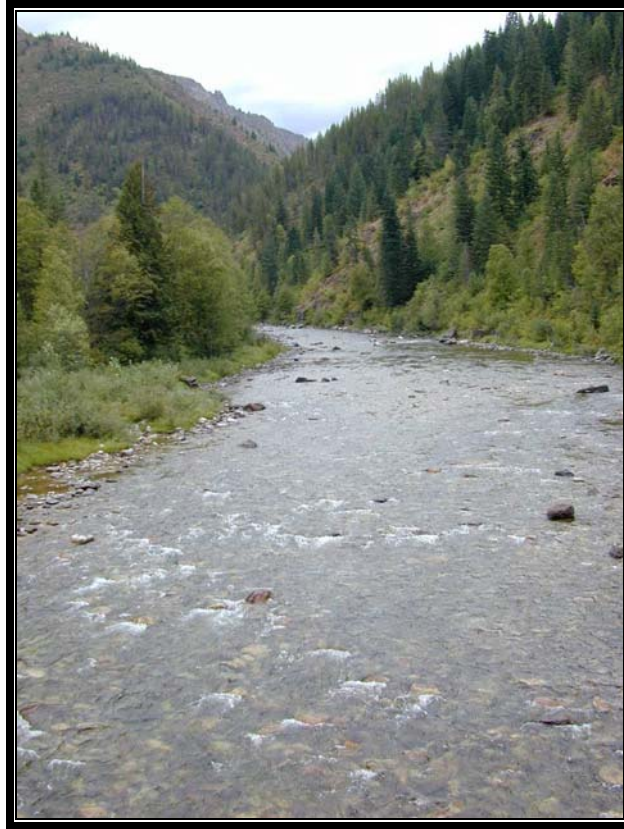


Upper North Fork Clearwater River Subbasin Assessment and Total Maximum Daily Loads



**Department of Environmental Quality
October 2003**

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Abbreviations, Acronyms, and Symbols

303(d)	Refers to section 303 subsection (d) of the Clean Water Act, or a list of impaired water bodies required by this section	ft	foot/feet
μ	micro, one-one thousandth	GIS	Geographical Information Systems
°C	degrees Centigrade	HI	habitat index
°F	degrees Fahrenheit	HUC	Hydrologic Unit Code
§	Section (usually a section of federal or state rules or statutes)	IDAPA	Refers to citations of Idaho administrative rules
%	percent	IDL	Idaho Department of Lands
#	number	INFISH	The federal Inland Native Fish Strategy
BMP	best management practice	JTU	Jackson turbidity units
BURP	Beneficial Use Reconnaissance Program	LTIU	long-term intermittent use
CFR	Code of Federal Regulations (refers to citations in the federal administrative rules)	MBI	macroinvertebrate biotic index
CE	cobble embeddedness	mm	millimeter
cfs	cubic feet per second	MWMT	maximum weekly maximum temperature
CNF	Clearwater National Forest	NA	not assessed
CWA	Clean Water Act	nd	no data (data not available)
CWE	cumulative watershed effects	NRCS	Natural Resources Conservation Service
DEQ	Department of Environmental Quality	NTU	nephelometric turbidity unit
FPA	Idaho Forest Practices Act	ORV	off-road vehicle
		RMS	root mean square
		SNOTEL	Snow Telemetry Station

SPZ	stream protection zone
TMDL	total maximum daily load
UNFCRS	Upper North Fork Clearwater River Subbasin
UNFCR	Upper North Fork Clearwater River
U.S.	United States
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WATBAL	Watershed Response Model for Forest Management
WBAG	Waterbody Assessment Guidance

Executive Summary

The federal Clean Water Act (CWA) requires that states and tribes restore and maintain the chemical, physical, and biological integrity of the nation's waters. States and tribes, pursuant to Section 303 of the CWA, are to adopt water quality standards necessary to protect fish, shellfish, and wildlife while providing for recreation in and on the waters whenever possible. Section 303(d) of the CWA establishes requirements for states and tribes to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). States and tribes must periodically publish a priority list of impaired waters, currently every two years. For waters identified on this list, states and tribes must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards. This document addresses the water bodies in the Upper North Fork Clearwater River Subbasin that have been placed on what is known as the "303(d) list."

This subbasin assessment and TMDL analysis has been developed to comply with Idaho's TMDL schedule. This assessment describes the physical, biological, and cultural setting; water quality status; pollutant sources; and recent pollution control actions in the Upper North Fork Clearwater River Subbasin located in north-central Idaho. The first part of this document, the subbasin assessment, is an important first step in leading to the TMDL. The starting point for this assessment was Idaho's 1998 303(d) list of water quality limited water bodies. Nineteen segments of the Upper North Fork Clearwater River Subbasin were listed on this list. The subbasin assessment portion of this document examines the current status of 303(d) listed waters, and defines the extent of impairment and causes of water quality limitation throughout the subbasin. The loading analysis quantifies pollutant sources and allocates responsibility for load reductions needed to return listed waters to a condition of meeting water quality standards.

Subbasin at a Glance

Water Quality at a Glance

<i>Hydrologic Unit Code</i>	17060307 Subbasin (Upper North Fork Clearwater River)
<i>Subbasin Area</i>	1,294 Square Miles (828,000 Acres)
<i>303(d) Listed Water Bodies</i>	Sneak Creek, Tumble Creek, Orogrande Creek, Tamarack Creek, Sylvan Creek, Hem Creek, Middle Creek, Marten Creek, Gravey Creek, China Creek, Sugar Creek, Swamp Creek, Osier Creek, Laundry Creek, Deception Gulch, Cold Springs Creek, Cool Creek, Grizzly Creek, Cougar Creek
<i>Beneficial Uses Affected</i>	Cold Water Aquatic Life, Salmonid Spawning (Federal Bull Trout Protection)
<i>Pollutants of Concern</i>	Sediment and Temperature as Non-Point Sources (No Point Source Pollutants)
<i>Land Uses</i>	Forestry, Roads, Recreation

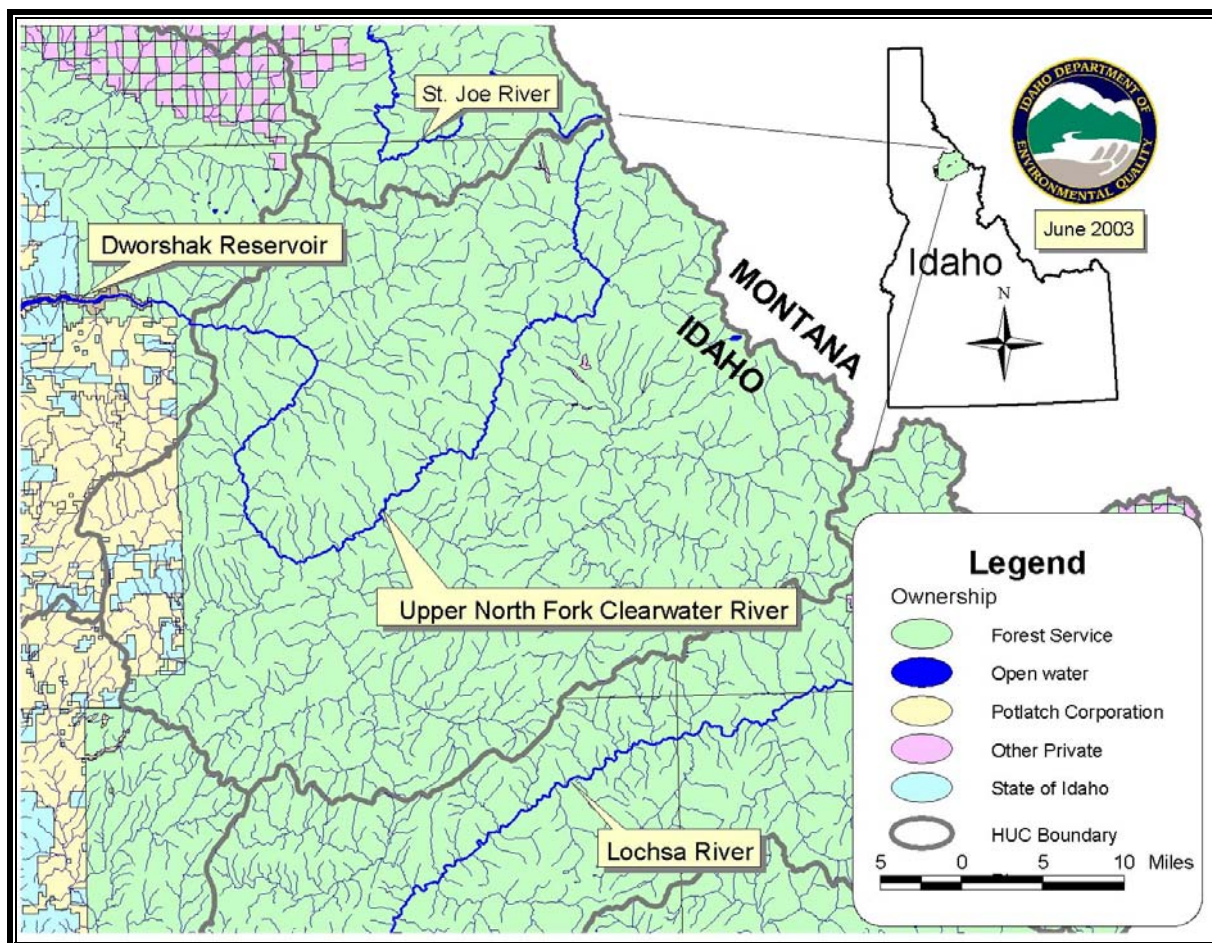


Figure A. Location in Idaho and Ownership of the Upper North Clearwater River Subbasin

The subbasin assessment evaluates the occurrence and effects of pollutants in each of the 303(d) listed water bodies, both in the context of the subbasin and with respect to the water quality of the individual streams. The Department of Environmental Quality *1996 Water Body Assessment Guidance* (WBAG) (DEQ 1996) is the primary tool used to assist in the evaluation of water quality. Water temperature is evaluated using results from continuous temperature recording stations established by the Clearwater National Forest. Such data are available for all of the 303(d) listed streams in this subbasin except Tumble, Sugar, and Marten Creeks. Water temperature is evaluated against the appropriate federal or state standard, depending on federal designation for bull trout protection, presence of cutthroat trout, presence of rainbow trout, and presence of brook trout. Sediment is evaluated using standardized data sets and procedures within the WBAG to determine whether beneficial uses are being supported. The designated beneficial uses for all the listed water bodies are cold water aquatic life and salmonid spawning. Finally, the results of the specific procedural analyses for both temperature and sediment are weighed against other data and information about the subbasin and a conclusion is reached whether or not a water body is impaired and, if so, by which pollutant.

Table A. 303(d) listed water bodies in the Upper North Fork Clearwater River Subbasin.

Stream Name	Boundaries¹	WQL Seg. No.²	Channel Type³	Stream Miles	Listed Pollutant⁴
Sneak Creek	HW to NF Clearwater River	5178	B	3.5	Channel Stability
Tumble Creek	HW to Washington Creek	5200	B	4.6	Sed
Orogrande Creek	HW to NF Clearwater River	3215	B	19.5	Sed
Tamarack Creek	HW to Orogrande Creek	5193	B	3.9	Sed
Sylvan Creek	HW to French Creek	5192	B	4.3	Sed
Hem Creek	HW to Sylvan Creek	5093	B	5.0	Sed
Middle Creek	HW to Weitas Creek	5123	B	13.3	Sed
Marten Creek	HW to Gravey Creek	5119	B	4.5	Sed
Gravey Creek	HW to Cayuse Creek	3229	A	9.0	Sed
China Creek	HW to Osier Creek	5040	A	4.9	Sed
Sugar Creek	HW to Swamp Creek	5189	B	4.0	Sed
Swamp Creek	HW to Osier Creek	5190	B	5.4	Sed
Osier Creek	HW to Moose Creek	3225	A&B	8.1	Sed, Temp
Laundry Creek	HW to Osier Creek	5104	A	4.4	Sed
Deception Gulch	HW to NF Clearwater River	5059	B	4.7	Sed
Cold Springs Creek	HW to NF Clearwater River	5045	A	4.8	Sed
Cool Creek	HW to Cold Springs Creek	5047	A	3.3	Sed
Grizzly Creek	HW to Quartz Creek	5088	A	4.5	Sed
Cougar Creek	HW to Quartz Creek	5049	A	3.7	Sed

¹ HW = Headwaters, NF = North Fork² WQL Seq No. = Water Quality Limited Segment Number³ A and B are Rosgen channel types (Rosgen 1994)⁴ Sed=Sediment; Temp=Temperature

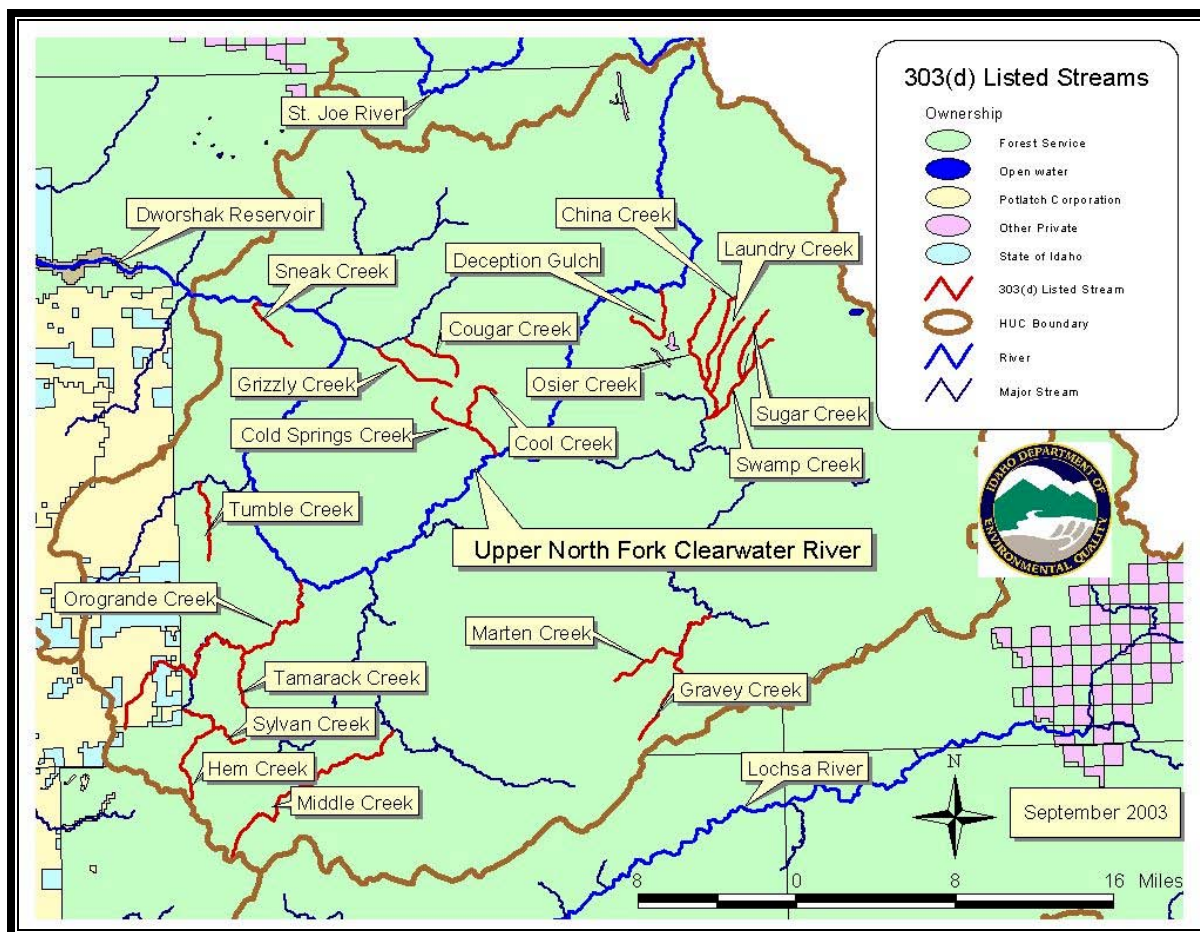


Figure B. 303(d) Listed Streams of the Upper North Fork Clearwater River Subbasin

Eleven of the water bodies (Cold Springs and Cool, Cougar, Grizzly, Gravey, Marten, Middle, Laundry, Osier, Sugar, and Swamp Creeks) are federally protected as bull trout watersheds. Based on the available data, none of these water bodies meets the federal bull trout water temperature standard. Orogrande, Tamarack, Hem, Sylvan, Sneak, and China Creeks have populations of cutthroat trout but do not meet the state's water temperature standard for this species. Hem Creek, however, is in near pristine condition and it is concluded that the temperature regime in this creek is natural. Deception Gulch has rainbow trout but does not meet the state's water temperature standard for rainbow trout. Tumble Creek has a population of brook trout and it is concluded that the state's water temperature standard for salmonid spawning is being met during the brook trout spawning season. Temperature TMDLs are written for every 303(d) listed water body except Hem Creek and Tumble Creek.

Key Findings

All the water bodies are 303(d) listed for sediment (only Osier Creek is listed for temperature). However, analysis of the data indicates that only one of the listed water

bodies, Deception Gulch, is water quality limited as the result of sediment. Except for Deception Gulch, we recommend that all the water bodies be removed from the 303(d) list for sediment. A sediment TMDL is written for Deception Gulch.

Temperature TMDLs are developed for 18 water bodies using percent stream canopy closure increase by stream segment as the target, based on the appropriate water temperature standard as the load capacity. The TMDL section discusses how the percent canopy closure target relates to heat as a pollutant. In order to meet the stream temperature targets in the various water bodies, 75-100 percent of the stream miles require increased stream canopy closure.

A sediment TMDL is developed for Deception Gulch based on sediment mass balance. Most of the excess sediment is coming from roads on high hazard landtypes and mass failures associated with these roads – the total required load reduction is assigned to these nonpoint sources. A sediment target is set at 390 tons/year, while total loading to the stream is on the order of 770 tons/year. The load reduction target is 380 tons/year, or about a 50 percent sediment loading reduction. To achieve this target, we recommend that the Clearwater National Forest obliterate approximately 50 percent of the roads in the watershed, especially those on high hazard landtypes.

Table B. Summary of conclusions and recommended actions.

Stream Name	Boundaries¹	Listed Pollutant	TMDLs Completed	Recommendations
China Creek	HW to Osier Creek	Sediment	Temperature	Delist for Sediment
Cold Springs Creek	HW to NF Clearwater River	Sediment	Temperature	Delist for Sediment
Cool Creek	HW to Cold Springs Creek	Sediment	Temperature	Delist for Sediment
Cougar Creek	HW to Quartz Creek	Sediment	Temperature	Delist for Sediment
Deception Gulch	HW to NF Clearwater River	Sediment	Temperature Sediment	None
Gravey Creek	HW to Cayuse Creek	Sediment	Temperature	Delist for Sediment
Grizzly Creek	HW to Quartz Creek	Sediment	Temperature	Delist for Sediment
Hem Creek	HW to Sylvan Creek	Sediment	None	Delist for Sediment
Laundry Creek	HW to Osier Creek	Sediment	Temperature	Delist for Sediment
Marten Creek	HW to Gravey Creek	Sediment	Temperature	Delist for Sediment
Middle Creek	HW to Weitas Creek	Sediment	Temperature	Delist for Sediment
Upper Orogrande Creek	HW to French Creek	Sediment	Temperature	Delist for Sediment
Lower Orogrande Creek	French Creek to NF Clearwater River	Sediment	Temperature	Delist for Sediment
Osier Creek	HW to Moose Creek	Sediment Temperature	Temperature	Delist for Sediment
Sneak Creek	HW to NF Clearwater River	Channel Stability	Temperature	Delist for Channel Stability
Sugar Creek	HW to Swamp Creek	Sediment	Temperature	Delist for Sediment
Swamp Creek	HW to Osier Creek	Sediment	Temperature	Delist for Sediment
Sylvan Creek	HW to French Creek	Sediment	Temperature	Delist for Sediment
Tamarack Creek	HW to Orogrande Creek	Sediment	Temperature	Delist for Sediment
Tumble Creek	HW to Washington Creek	Sediment	None	Delist for Sediment

¹ HW = Headwaters, NF = North Fork

Appendix 1 presents a table that correlates the 303(d) listed streams addressed in this TMDL to the “assessment units” being developed by the state and the U.S. Environmental Protection Agency for the purposes of tracking water quality status.